

# **Summary of Deficiencies in the Preliminary ENDF/B-VII**

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## Abstract

We summarize deficiencies in the Preliminary ENDF/B-VII library focusing on items that should be addressed by the NNDC.

## **ENDF/B-VII b0**

The preliminary ENDF/B-VII beta0 library, created by the ENDF manager (Mike Herman, NNDC) on March 11, 2005, contains neutron evaluations for 340 materials. Out of them, 85 materials are new or revised evaluations, while the remaining 235 materials were taken from ENDF/B-VI.8, see [www.nndc.bnl.gov/csewg\\_members](http://www.nndc.bnl.gov/csewg_members)

## **Data Verification**

Data verification (phase 1 testing) should be done by the NNDC. This includes runs by checking codes CHECKR, FIZCON and PSYCHE, followed by simple NJOY runs to ensure that files can be processed, and completed by simple MCNP runs to ensure that files would not crash in Monte Carlo calculations for data validation (phase 2 testing).

All new/modified files (85 materials) included in ENDF/B-VII b0 were successfully run through NJOY and MCNP.

## **Summary of Deficiencies**

1. Deficiencies in ENDF/B-VI as given on CSWEG Webpage. Most of them are likely valid also for ENDF/B-VII. The list, prepared by V. McLane, was last updated in May 2003, for details see **Attachment 1**.
2. Deficiencies in some LANL evaluations identified at CSEWG Meeting in Nov 2004, for more details see **Attachment 2**:

- Cl and Hg – solve errors identified by checking codes (DONE)
  - $^{89}\text{Y}$ ,  $^{191,193}\text{Ir}$ ,  $^{169}\text{Tm}$  – use dosimetry part from LANL and produce complete evaluations
3. Deficiencies in completeness of ENDF/B-VI.8 identified by Red Cullen, LLNL in January 2005. See **Attachment 3**.
4. Problems in ENDF/B-VIIb0 suggested by Steven van der Marck and Arjan Koning (NRG Petten). Reported at Gen-IV Workshop, Antwerp on April 5-7, 2005. Reviewed by Mark Chadwick and Dick McKnight at Antwerp, possible actions are indicated:
- Zr-90, 91, 92, 93, 94, 95, 96 → to be replaced by SG23 or JENDL-3.3
  - Pa-231, 232, 233 → to be replaced by JENDL-3.3
  - Np-237 → to be improved by LANL or replaced by JENDL-3.3
  - Cu-63, 65 → ?
  - Th-232 → to be replaced by IAEA-CRP or Maslov (JEFF-3.1)
5. Fission products, in general defined as  $Z = 31 - 68$  (218 materials = 196 materials currently in ENDF/B-VI plus 22 materials not in ENDF/B-VI). Most of these materials should be replaced by more modern evaluations.

Files most likely to be used:

- 164 materials already prepared by WPEC SG23 activity
  - 139 materials were successfully run through NJOY and MCNP
  - 25 materials indicated some problems with NJOY
- 24 materials by BNL-KAERI and BNL-JAERI submitted to ENDF/B-VII
  - Currently being revised by Hyeong-II Kim, KAERI
- 5 materials (Ge isotopes) by BNL-JAERI submitted to ENDF/B-VII
  - URR to be adjusted for 3 materials (DONE all 5 evaluations revised by Pronyaev)
- 25 materials to be produced by Empire.

## Attachment 1

### Known Errors and Deficiencies in ENDF/B-VI

Received from Charlie on CD, April 28, 2005. Corresponds to the list of Known Errors and Deficiencies in ENDF/B-VI as available on CSEWG webpage (prepared by V. McLane, last updated in May 21, 2003) see <http://www.nndc.bnl.gov/csewg/errors.html>.

Material	MF	MT	Comment
0725	14N	28, 32	Gamma production files exist, but there are no cross sections files
2200	Ti	3	104 Nonzero threshold
2425	50Cr	6	16 Residual nucleus incorrect
2437	54Cr	6	16 Residual nucleus incorrect
2525	55Mn	6	22 Residual nucleus incorrect
		6	107 Residual nucleus incorrect
2625	54Fe	6	16 Residual nucleus incorrect
		6	103 Residual nucleus incorrect
2631	56Fe	3	2 NJOY calculates negative cross section
2637	58Fe	6	16 Residual nucleus incorrect
2834	61Ni	3	2 NJOY calculates negative cross section
2837	62Ni	6	22 Residual nucleus incorrect
		6	28 Residual nucleus incorrect
*****SG23 range starts here *****			
3231	72Ge	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3234	73Ge	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3237	74Ge	3	2 NJOY calculates negative cross section
3243	76Ge	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3325	75As	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3431	76Se	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3434	77Se	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3437	78Se	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3443	80Se	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3449	82Se	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3625	78Kr	3	2 RESEND calculates negative cross section
3631	80Kr	3	2 RESEND calculates negative cross section
3643	84Kr	3	2 RESEND calculates negative cross section
3825	84Sr	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
3831	86Sr	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section
4125	93Nb	3	2 RESEND calculates negative cross section
4225	92Mo	3	1 RESEND calculates negative cross section
		3	2 RESEND calculates negative cross section

4231	94Mo	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
4234	95Mo	3	1	Error in cross section at upper level of URR (206.2685 keV. Value given is total cross section (10.81351); it be background.
		3	4	Lower limit of energy range (206.07 keV) below upper limit of URR(206.2685 keV).
4237	96Mo	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
4243	98Mo	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
4249	100Mo	3	2	RESEND calculates negative cross section
4325	99Tc	3	2	Error in cross section at 143.4 keV. Given as 6.201176; bracketed by cross sections of 9.947290 and 9.730980.
		3	4	Lower limit of energy range (141.400 keV) below upper limit of URR(141.944 keV).
4440	101Ru	3	4	Lower limit of energy range (128.47 keV) below upper limit of URR (128.49 keV).
4449	104Ru	3	2	RESEND calculates negative cross section
4525	103Rh	3	2	RESEND calculates negative cross section
4634	105Pd	3	1	Error in cross section at 283.207 keV (upper limit of URR). Value given is total cross section (9.859317); should be background.
4840	111Cd	3	2	RESEND calculates negative cross section
4846	113Cd	3	2	RESEND calculates negative cross section
5025	112Sn	3	2	RESEND calculates negative cross section
5031	114Sn	3	2	RESEND calculates negative cross section
5037	116Sn	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
5043	118Sn	3	2	RESEND calculates negative cross section
5231	122Te	3	2	RESEND calculates negative cross section
5234	123Te	3	2	RESEND calculates negative cross section
5237	124Te	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
5240	125Te	3	2	RESEND calculates negative cross section
5243	126Te	3	2	RESEND calculates negative cross section
5249	128Te	3	2	RESEND calculates negative cross section
5255	130Te	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
5446	131Xe	3	4	Lower limit of energy range (80.6164 keV) below upper limit of URR (80.8033 keV).
5728	139La	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
5925	141Pr	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
		3	4	Lower limit of energy range (146.04 keV) below upper limit of URR(146.472 keV).
6025	142Nd	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
6028	143Nd	3	1	Cross section at upper limit of URR energy range (225 keV) not given.
6031	144Nd	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
6028	145Nd	3	4	Lower limit of energy range (67.466 keV) below upper limit of URR (67.688 keV).
6037	146Nd	3	1	RESEND calculates negative cross section

		3	2	RESEND calculates negative cross section
6043	148Nd	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
6049	150Nd	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
6234	147Sm	2	451	Fission widths should be removed. D. Cullen
		3	104-106	Nonzero threshold S. Frankel
6246	151Sm	2	151	Inelastic cross section is added to file 3 MT=1 background. This is not appropriate since inelastic cross section has structure. Include as competitive width in file 2 and remove as cross section background.
6246	152Sm	2	102	Small cross section mismatch (about 1 mb) at upper limit of URR(122.59 keV).
6255	154Sm	3	1	RESEND calculates negative cross section
		3	2	RESEND calculates negative cross section
6337	153Eu	3	1	Error in cross section at 83.91 keV (upper limit of URR). Value given is total cross section (10.245); should be background(0.0).
6337	155Eu	3	22	Nonzero threshold
			103-106	Nonzero threshold
6337	155Gd	3	102	Duplicate values for cross section at 60.4 keV (upper limit of URR). One should be removed.
6440	157Gd	3	22	Nonzero threshold
6443	158Gd	3	22	Nonzero threshold
6449	160Gd	3	22	Nonzero threshold
6637	160Dy	3	2	RESEND calculates negative cross section
6643	162Dy	3	2	RESEND calculates negative cross section
6646	163Dy	3	2	RESEND calculates negative cross section
*****SG23 range ends here *****				
7125	175Lu	3	2	RESEND calculates negative cross section
7328	181Ta	3	103	Nonzero threshold
9034	230Th	2	151	Fission widths not given.
		3	2	RESEND calculates negative cross section
9137	233Pa	2	151	Fission widths not given.
9219	232U	3	2	RESEND calculates negative cross section
9231	236U	2	151	LFW=0, but fission widths given.
9434	238Pu	3	2	NJOY calculates negative cross section
9437	239Pu	2	151	Last resonance does not correspond to top of URR
		3	2	RESEND calculates negative cross section
9446	242Pu	3	2	RESEND calculates negative cross section
9452	244Pu	1	458	Prompt KE of gammas = 6 eV
9631	242Cm	1	458	Prompt KE of gammas = 6 eV
		3	2	RESEND calculates negative cross section
9637	244Cm	3	2	NJOY and RESEND calculate negative cross section
9643	246Cm	3	2	NJOY calculates negative cross section
9638	248Cm	1	458	Prompt KE of gammas = 6 eV
		3	1	RESEND calculates negative cross section
		3	2	RESEND and NJOY calculate negative cross section
9752	249Bk	5	455	Missing; MF=1,MT=455 present.
9855	250Cf	3	2	RESEND calculates negative cross section
9861	252Cf	3	2	RESEND calculates negative cross section

## **Attachment 2**

### **LANL evaluations to be fixed**

\*\* Identified at CSEWG Meeting, November 2004 \*\*  
\*\* To be done by the NNDC \*\*

1. Fix format problems in LANL evaluations as identified by the checking codes CHECKR, FIZCON and PSYCHE for
  - Cl isotopes, (DONE)
  - Hg isotopes, (DONE)
  - Correct remaining deficiencies in collaboration with LANL,
  - Complete data verification (NJOY and MCNP)
2. Integrate new LANL cross section dosimetry evaluations into complete ENDF files
  - Use dosimetry cross-sections for  $^{89}\text{Y}$ ,  $^{191,193}\text{Ir}$  and  $^{169}\text{Tm}$ ,
  - Calculate missing reactions & spectra using EMPIRE code,
  - Create complete ENDF files and perform data verification.

## Attachment 3

### Red Cullen's List

List prepared by Red Cullen, LLNL, January 26, 2005.

Red considered all **328 materials** in ENDF/B-VI.8. The list below first summarizes MT numbers used in MF=2,3,4,5,6. Second, it looks into completeness of files from the point of view of transport calculations.

#### Part 1: Summary

MT	MF=2	MF=3	MF=4	MF=5	MF=6	
1	0	316	0	0	0	Total
2	0	320	316	0	0	Elastic
3	0	51	0	0	0	Nonelastic
4	0	306	0	0	0	Inelastic
5	0	32	0	0	32	(n,remainder)
16	0	189	145	145	44	(n,2n)
17	0	114	97	97	17	(n,3n)
18	0	43	43	43	0	Fission
19	0	19	14	16	0	(n,f) First Chance
20	0	19	14	16	0	(n,nf) Second Chance
21	0	11	6	8	0	(n,2nf) Third Chance
22	0	82	51	51	31	(n,n') a
23	0	1	0	0	1	(n,n') 3a
24	0	9	2	2	7	(n,2n) a
25	0	1	1	1	0	(n,3n) a
28	0	93	59	59	32	(n,n') p
32	0	26	15	15	11	(n,n') d
33	0	15	13	13	2	(n,n') t
37	0	26	13	13	13	(n,4n)
38	0	4	1	1	0	(n,3nf) Fourth Chance
41	0	8	0	0	8	(n,2n) p
44	0	2	0	0	2	(n,n') 2p
45	0	2	0	0	2	(n,n') p a
51	0	273	242	0	30	(n,n') Level
52	0	268	238	0	30	(n,n') Level
53	0	263	235	0	28	(n,n') Level
54	0	245	217	0	28	(n,n') Level
55	0	222	196	0	26	(n,n') Level
56	0	204	179	0	25	(n,n') Level
57	0	182	159	0	23	(n,n') Level
58	0	172	150	0	22	(n,n') Level
59	0	152	132	0	20	(n,n') Level
60	0	142	122	0	20	(n,n') Level
61	0	122	103	0	19	(n,n') Level
62	0	115	97	0	18	(n,n') Level
63	0	103	85	0	18	(n,n') Level
64	0	90	75	0	15	(n,n') Level
65	0	74	60	0	14	(n,n') Level
66	0	69	55	0	14	(n,n') Level
67	0	65	51	0	14	(n,n') Level
68	0	59	46	0	13	(n,n') Level

69	0	55	42	0	13 (n,n') Level
70	0	38	26	0	12 (n,n') Level
71	0	36	24	0	12 (n,n') Level
72	0	34	23	0	11 (n,n') Level
73	0	32	22	0	10 (n,n') Level
74	0	31	21	0	10 (n,n') Level
75	0	24	19	0	5 (n,n') Level
76	0	23	18	0	5 (n,n') Level
77	0	23	18	0	5 (n,n') Level
78	0	19	15	0	4 (n,n') Level
79	0	17	13	0	4 (n,n') Level
80	0	15	12	0	3 (n,n') Level
81	0	14	12	0	2 (n,n') Level
82	0	11	9	0	2 (n,n') Level
83	0	10	8	0	2 (n,n') Level
84	0	10	8	0	2 (n,n') Level
85	0	9	7	0	2 (n,n') Level
86	0	8	6	0	2 (n,n') Level
87	0	8	6	0	2 (n,n') Level
88	0	8	6	0	2 (n,n') Level
89	0	8	6	0	2 (n,n') Level
90	0	5	4	0	1 (n,n') Level
91	0	302	262	262	40 (n,n') Continuum
102	0	320	0	0	0 (n,g)
103	0	148	0	0	19 (n,p)
104	0	87	0	0	0 (n,d)
105	0	72	1	0	0 (n,t)
106	0	46	0	0	0 (n,He-3)
107	0	136	0	0	18 (n,a)
108	0	5	0	0	2 (n,2a)
111	0	9	0	0	3 (n,2p)
112	0	7	0	0	3 (n,p) a
113	0	1	0	0	0 (n,t) 2a
117	0	1	0	0	1 (n,d) a
151	328	0	0	0	0 Resonance Parameters
203	0	3	0	0	0 Hydrogen Production
204	0	2	0	0	0 Deuterium Production
205	0	2	0	0	0 Tritium Production
206	0	2	0	0	0 He-3 Production
207	0	3	0	0	0 He-4 Production
251	0	3	0	0	0 Mu-(Lab)
252	0	2	0	0	0 Xi
253	0	2	0	0	0 Gamma
455	0	0	0	21	0 Delayed nu-bar
600	0	17	2	0	13 (n,p') Ground
601	0	16	2	0	12 (n,p') Level
602	0	14	2	0	10 (n,p') Level
603	0	14	2	0	10 (n,p') Level
604	0	13	1	0	10 (n,p') Level
605	0	12	1	0	9 (n,p') Level
606	0	9	1	0	7 (n,p') Level
607	0	8	1	0	7 (n,p') Level
608	0	8	1	0	7 (n,p') Level
609	0	8	1	0	7 (n,p') Level
610	0	8	1	0	7 (n,p') Level
611	0	8	1	0	7 (n,p') Level
612	0	8	1	0	7 (n,p') Level

613	0	8	1	0	7 (n,p') Level
614	0	7	1	0	6 (n,p') Level
615	0	5	0	0	5 (n,p') Level
616	0	4	0	0	4 (n,p') Level
617	0	4	0	0	4 (n,p') Level
618	0	4	0	0	4 (n,p') Level
619	0	4	0	0	4 (n,p') Level
620	0	2	0	0	2 (n,p') Level
621	0	2	0	0	2 (n,p') Level
622	0	2	0	0	2 (n,p') Level
623	0	1	0	0	1 (n,p') Level
624	0	1	0	0	1 (n,p') Level
625	0	1	0	0	1 (n,p') Level
626	0	1	0	0	1 (n,p') Level
627	0	1	0	0	1 (n,p') Level
628	0	1	0	0	1 (n,p') Level
629	0	1	0	0	1 (n,p') Level
649	0	14	1	1	13 (n,p') Level
650	0	13	1	0	11 (n,d') Ground
651	0	12	1	0	10 (n,d') Level
652	0	12	1	0	10 (n,d') Level
653	0	12	1	0	10 (n,d') Level
654	0	10	1	0	9 (n,d') Level
655	0	8	1	0	7 (n,d') Level
656	0	8	1	0	7 (n,d') Level
657	0	8	1	0	7 (n,d') Level
658	0	8	1	0	7 (n,d') Level
659	0	8	1	0	7 (n,d') Level
660	0	8	1	0	7 (n,d') Level
661	0	8	1	0	7 (n,d') Level
662	0	7	1	0	6 (n,d') Level
663	0	7	1	0	6 (n,d') Level
664	0	7	1	0	6 (n,d') Level
665	0	6	1	0	5 (n,d') Level
666	0	6	1	0	5 (n,d') Level
667	0	5	1	0	4 (n,d') Level
668	0	5	1	0	4 (n,d') Level
669	0	5	1	0	4 (n,d') Level
670	0	1	0	0	1 (n,d') Level
671	0	1	0	0	1 (n,d') Level
672	0	1	0	0	1 (n,d') Level
673	0	1	0	0	1 (n,d') Level
674	0	1	0	0	1 (n,d') Level
675	0	1	0	0	1 (n,d') Level
676	0	1	0	0	1 (n,d') Level
677	0	1	0	0	1 (n,d') Level
678	0	1	0	0	1 (n,d') Level
679	0	1	0	0	1 (n,d') Level
680	0	1	0	0	1 (n,d') Level
699	0	10	0	0	10 (n,d') Level
700	0	7	1	0	5 (n,t') Ground
701	0	7	1	0	5 (n,t') Level
702	0	5	1	0	4 (n,t') Level
703	0	5	1	0	4 (n,t') Level
704	0	4	1	0	3 (n,t') Level
705	0	4	1	0	3 (n,t') Level
706	0	4	1	0	3 (n,t') Level

707	0	4	1	0	3 (n,t') Level
708	0	4	1	0	3 (n,t') Level
709	0	4	1	0	3 (n,t') Level
710	0	3	0	0	3 (n,t') Level
711	0	2	0	0	2 (n,t') Level
712	0	2	0	0	2 (n,t') Level
713	0	2	0	0	2 (n,t') Level
714	0	2	0	0	2 (n,t') Level
715	0	2	0	0	2 (n,t') Level
716	0	1	0	0	1 (n,t') Level
717	0	1	0	0	1 (n,t') Level
718	0	1	0	0	1 (n,t') Level
719	0	1	0	0	1 (n,t') Level
720	0	1	0	0	1 (n,t') Level
721	0	1	0	0	1 (n,t') Level
722	0	1	0	0	1 (n,t') Level
723	0	1	0	0	1 (n,t') Level
724	0	1	0	0	1 (n,t') Level
725	0	1	0	0	1 (n,t') Level
726	0	1	0	0	1 (n,t') Level
727	0	1	0	0	1 (n,t') Level
728	0	1	0	0	1 (n,t') Level
729	0	1	0	0	1 (n,t') Level
730	0	1	0	0	1 (n,t') Level
749	0	5	0	0	5 (n,t') Level
800	0	19	2	0	15 (n,a') Ground
801	0	18	2	0	14 (n,a') Level
802	0	16	2	0	13 (n,a') Level
803	0	15	2	0	12 (n,a') Level
804	0	14	1	0	12 (n,a') Level
805	0	14	1	0	12 (n,a') Level
806	0	13	1	0	11 (n,a') Level
807	0	13	1	0	11 (n,a') Level
808	0	13	1	0	11 (n,a') Level
809	0	13	1	0	11 (n,a') Level
810	0	13	1	0	11 (n,a') Level
811	0	12	1	0	11 (n,a') Level
812	0	10	0	0	10 (n,a') Level
813	0	10	0	0	10 (n,a') Level
814	0	10	0	0	10 (n,a') Level
815	0	10	0	0	10 (n,a') Level
816	0	9	0	0	9 (n,a') Level
817	0	9	0	0	9 (n,a') Level
818	0	9	0	0	9 (n,a') Level
819	0	9	0	0	9 (n,a') Level
820	0	2	0	0	2 (n,a') Level
821	0	1	0	0	1 (n,a') Level
822	0	1	0	0	1 (n,a') Level
823	0	1	0	0	1 (n,a') Level
824	0	1	0	0	1 (n,a') Level
849	0	15	1	1	14 (n,a') Level

**Part 2: (n,2n), (n,3n) and (n,4n) data**

ENDF/B Data for (n,2n), (n,3n), (n,4n)

ZA	React	Q-Value	
1001		-2.22500200D+00	No (n,Xn)
1002	(n,2n)		No Data
1002	(n,3n)		No Data
1002	(n,4n)		No Data
1003	(n,2n)	-6.25760000D+00	No Data
1003	(n,3n)		No Data
1003	(n,4n)		No Data
2003		-1.57280000D+00	No (n,Xn)
2004		-1.05534700D+01	No (n,Xn)
3006		-7.25050000D+00	No (n,Xn)
3007	(n,2n)		No Data
3007	(n,3n)		No Data
3007	(n,4n)		No Data
4009	(n,2n)	-1.14541000D+01	No Data
4009	(n,3n)		No Data
4009	(n,4n)		No Data
5010		-1.08330000D+01	No (n,Xn)
5011	(n,2n)	-1.30582000D+01	No Data
5011	(n,3n)		No Data
5011	(n,4n)		No Data
6000		-1.24140000D+01	No (n,Xn)
7014	(n,2n)	-8.47380000D+00	No Data
7014	(n,3n)		No Data
7014	(n,4n)		No Data
7015	(n,2n)	-4.14430000D+00	No Data
7015	(n,3n)		No Data
7015	(n,4n)		No Data
8016	(n,2n)	-1.56638000D+01	No Data
8016	(n,3n)		No Data
8016	(n,4n)		No Data
8017	(n,2n)	-1.04310000D+01	No Data
8017	(n,3n)		No Data
8017	(n,4n)		No Data
9019	(n,2n)	-1.24140000D+01	No Data
9019	(n,3n)		No Data
9019	(n,4n)		No Data
11023	(n,2n)	-7.31600000D+00	No Data
11023	(n,3n)		No Data
11023	(n,4n)		No Data
12000	(n,2n)	-1.30582000D+01	No Data
12000	(n,3n)		No Data
12000	(n,4n)		No Data
12024		-1.71770000D+01	No (n,Xn)
13027	(n,2n)	-1.24140000D+01	No Data
13027	(n,3n)		No Data
13027	(n,4n)		No Data
14000	(n,2n)	-1.04310000D+01	No Data
14000	(n,3n)		No Data
14000	(n,4n)		No Data
14028	(n,2n)	-1.71770000D+01	No (n,Xn)

14028	(n, 3n)	No Data
14028	(n, 4n)	No Data
14029	(n, 2n)	-8.47390000D+00
14029	(n, 3n)	No Data
14029	(n, 4n)	No Data
14030	(n, 2n)	-1.06100000D+01
14030	(n, 3n)	No Data
14030	(n, 4n)	No Data
15031	(n, 2n)	-1.23100000D+01
15031	(n, 3n)	No Data
15031	(n, 4n)	No Data
16000	(n, 2n)	-8.64220000D+00
16000	(n, 3n)	No Data
16000	(n, 4n)	No Data
16032	(n, 2n)	-1.50880000D+01
16032	(n, 3n)	No Data
16032	(n, 4n)	No Data
17000	(n, 2n)	-1.26501000D+01
17000	(n, 3n)	No Data
17000	(n, 4n)	No Data
17035	(n, 2n)	-1.26450000D+01
17035	(n, 3n)	No Data
17035	(n, 4n)	No Data
17037	(n, 2n)	-1.03111000D+01
17037	(n, 3n)	-1.88908000D+01
17037	(n, 4n)	No Data
18040	-----	No (n, Xn)
19000	(n, 2n)	-1.30710000D+01
19000	(n, 3n)	No Data
19000	(n, 4n)	No Data
19041	-----	No (n, Xn)
20000	(n, 2n)	-1.00280000D+01
20000	(n, 3n)	No Data
20000	(n, 4n)	No Data
21045	(n, 2n)	-1.14540000D+01
21045	(n, 3n)	No Data
21045	(n, 4n)	No Data
22000	(n, 2n)	-8.14300000D+00
22000	(n, 3n)	-1.90920000D+01
22000	(n, 4n)	No Data
22046	-----	No (n, Xn)
22047	-----	No (n, Xn)
22048	-----	No (n, Xn)
22050	-----	No (n, Xn)
23000	(n, 2n)	-1.10510000D+01
23000	(n, 3n)	No Data
23000	(n, 4n)	No Data
24050	(n, 2n)	-1.30000000D+01
24050	(n, 3n)	No Data
24050	(n, 4n)	No Data
24052	(n, 2n)	-1.20390000D+01
24052	(n, 3n)	No Data
24052	(n, 4n)	No Data
24053	(n, 2n)	-7.94000000D+00
24053	(n, 3n)	No Data
24053	(n, 4n)	No Data
24054	(n, 2n)	-9.71900000D+00

24054	(n, 3n)	No Data
24054	(n, 4n)	No Data
25055	(n, 2n)	-1.02270000D+01
25055	(n, 3n)	No Data
25055	(n, 4n)	No Data
26054	(n, 2n)	-1.33800000D+01
26054	(n, 3n)	No Data
26054	(n, 4n)	No Data
26056	(n, 2n)	-1.12000000D+01
26056	(n, 3n)	No Data
26056	(n, 4n)	No Data
26057	(n, 2n)	-7.64600000D+00
26057	(n, 3n)	No Data
26057	(n, 4n)	No Data
26058	(n, 2n)	-1.00440000D+01
26058	(n, 3n)	No Data
26058	(n, 4n)	No Data
27059	(n, 2n)	-1.04540000D+01
27059	(n, 3n)	No Data
27059	(n, 4n)	No Data
28058	(n, 2n)	-1.21960000D+01
28058	(n, 3n)	No Data
28058	(n, 4n)	No Data
28059	-----	No (n, Xn)
28060	(n, 2n)	-1.13890000D+01
28060	(n, 3n)	No Data
28060	(n, 4n)	No Data
28061	(n, 2n)	-7.82030000D+00
28061	(n, 3n)	No Data
28061	(n, 4n)	No Data
28062	(n, 2n)	-1.05980000D+01
28062	(n, 3n)	No Data
28062	(n, 4n)	No Data
28064	(n, 2n)	-9.65700000D+00
28064	(n, 3n)	No Data
28064	(n, 4n)	No Data
29063	(n, 2n)	-1.08540000D+01
29063	(n, 3n)	No Data
29063	(n, 4n)	No Data
29065	(n, 2n)	-9.91000000D+00
29065	(n, 3n)	No Data
29065	(n, 4n)	No Data
*****SG23 range starts here *****		
31000	(n, 2n)	-9.30800000D+00
31000	(n, 3n)	No Data
31000	(n, 4n)	No Data
32072	-----	No (n, Xn)
32073	-----	No (n, Xn)
32074	-----	No (n, Xn)
32076	-----	No (n, Xn)
33075	-----	No (n, Xn)
34074	-----	No (n, Xn)
34076	-----	No (n, Xn)
34077	-----	No (n, Xn)
34078	-----	No (n, Xn)
34080	-----	No (n, Xn)
34082	-----	No (n, Xn)

35079	-----	No (n,Xn)
35081	-----	No (n,Xn)
36078	(n,2n) -1.19810000D+01	
36078	(n,3n)	No Data
36078	(n,4n)	No Data
36080	(n,2n) -1.15250000D+01	
36080	(n,3n)	No Data
36080	(n,4n)	No Data
36082	(n,2n) -1.09800000D+01	
36082	(n,3n)	No Data
36082	(n,4n)	No Data
36083	(n,2n) -7.46700000D+00	
36083	(n,3n) -1.84500000D+01	
36083	(n,4n)	No Data
36084	(n,2n) -1.05180000D+01	
36084	(n,3n)	No Data
36084	(n,4n)	No Data
36085	-----	No (n,Xn)
36086	(n,2n) -9.86000000D+00	
36086	(n,3n) -1.69710000D+01	
36086	(n,4n)	No Data
37085	(n,2n) -1.04740000D+01	
37085	(n,3n)	No Data
37085	(n,4n)	No Data
37086	-----	No (n,Xn)
37087	(n,2n) -9.92300000D+00	
37087	(n,3n)	No Data
37087	(n,4n)	No Data
38084	-----	No (n,Xn)
38086	-----	No (n,Xn)
38087	-----	No (n,Xn)
38088	-----	No (n,Xn)
38089	-----	No (n,Xn)
38090	-----	No (n,Xn)
39089	(n,2n) -1.14700000D+01	
39089	(n,3n)	No Data
39089	(n,4n)	No Data
39090	-----	No (n,Xn)
39091	-----	No (n,Xn)
40000	(n,2n) -7.19000000D+00	
40000	(n,3n)	No Data
40000	(n,4n)	No Data
40090	(n,2n) -1.19900000D+01	
40090	(n,3n)	No Data
40090	(n,4n)	No Data
40091	(n,2n) -7.19000000D+00	
40091	(n,3n)	No Data
40091	(n,4n)	No Data
40092	(n,2n) -8.64000000D+00	
40092	(n,3n)	No Data
40092	(n,4n)	No Data
40093	-----	No (n,Xn)
40094	(n,2n) -8.19000000D+00	
40094	(n,3n)	No Data
40094	(n,4n)	No Data
40095	-----	No (n,Xn)
40096	(n,2n) -7.84000000D+00	

40096	(n,3n)	No Data
40096	(n,4n)	No Data
41093	(n,2n)	-8.83300000D+00
41093	(n,3n)	-1.67150000D+01
41093	(n,4n)	No Data
41094	-----	No (n,Xn)
41095	-----	No (n,Xn)
42000	(n,2n)	-7.91677000D+00
42000	(n,3n)	-1.48439000D+01
42000	(n,4n)	No Data
42092	-----	No (n,Xn)
42094	-----	No (n,Xn)
42095	-----	No (n,Xn)
42096	-----	No (n,Xn)
42097	-----	No (n,Xn)
42098	-----	No (n,Xn)
42099	-----	No (n,Xn)
42100	-----	No (n,Xn)
43099	(n,2n)	-8.88000000D+00
43099	(n,3n)	No Data
43099	(n,4n)	No Data
44096	-----	No (n,Xn)
44098	-----	No (n,Xn)
44099	-----	No (n,Xn)
44100	-----	No (n,Xn)
44101	-----	No (n,Xn)
44102	-----	No (n,Xn)
44103	-----	No (n,Xn)
44104	-----	No (n,Xn)
44105	-----	No (n,Xn)
44106	-----	No (n,Xn)
45103	(n,2n)	-9.40000000D+00
45103	(n,3n)	No Data
45103	(n,4n)	No Data
45105	-----	No (n,Xn)
46102	(n,2n)	-1.05594000D+01
46102	(n,3n)	-1.88398000D+01
46102	(n,4n)	No Data
46104	(n,2n)	-9.99338000D+00
46104	(n,3n)	-1.76178000D+01
46104	(n,4n)	-2.81771000D+01 Over 20 MeV
46105	(n,2n)	-7.09438000D+00
46105	(n,3n)	-1.70878000D+01
46105	(n,4n)	-2.47121000D+01 Over 20 MeV
46106	(n,2n)	-9.56238000D+00
46106	(n,3n)	-1.66568000D+01
46106	(n,4n)	-2.66501000D+01 Over 20 MeV
46107	-----	No (n,Xn)
46108	(n,2n)	-9.22038000D+00
46108	(n,3n)	-1.57588000D+01
46108	(n,4n)	-2.53211000D+01 Over 20 MeV
46110	(n,2n)	-8.81138000D+00
46110	(n,3n)	-1.49648000D+01
46110	(n,4n)	-2.41851000D+01 Over 20 MeV
47107	(n,2n)	-9.54700000D+00
47107	(n,3n)	-1.74700000D+01
47107	(n,4n)	No Data

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47109 (n,2n) -9.18600000D+00
47109 (n,3n) -1.64550000D+01
47109 (n,4n) No Data
47111 ----- No (n,Xn)
48106 (n,2n) -1.08670000D+01
48106 (n,3n) No Data
48106 (n,4n) No Data
48108 (n,2n) -1.03340000D+01
48108 (n,3n) -1.82610000D+01
48108 (n,4n) No Data
48110 (n,2n) -9.88030400D+00
48110 (n,3n) -1.72430000D+01
48110 (n,4n) No Data
48111 (n,2n) -6.97560200D+00
48111 (n,3n) -1.68580000D+01
48111 (n,4n) No Data
48112 (n,2n) -9.39710400D+00
48112 (n,3n) -1.63740000D+01
48112 (n,4n) No Data
48113 (n,2n) -6.54410100D+00
48113 (n,3n) -1.59390000D+01
48113 (n,4n) No Data
48114 (n,2n) -9.04070000D+00
48114 (n,3n) -1.55830000D+01
48114 (n,4n) No Data
48115 ----- No (n,Xn)
48116 (n,2n) -8.69700000D+00
48116 (n,3n) -1.48420000D+01
48116 (n,4n) No Data
49000 (n,2n) -9.03700000D+00
49000 (n,3n) -1.63080000D+01
49000 (n,4n) No Data
49113 ----- No (n,Xn)
49115 ----- No (n,Xn)
50112 ----- No (n,Xn)
50114 ----- No (n,Xn)
50115 ----- No (n,Xn)
50116 ----- No (n,Xn)
50117 ----- No (n,Xn)
50118 ----- No (n,Xn)
50119 ----- No (n,Xn)
50120 ----- No (n,Xn)
50122 ----- No (n,Xn)
50123 ----- No (n,Xn)
50124 ----- No (n,Xn)
50125 ----- No (n,Xn)
50126 ----- No (n,Xn)
51121 (n,2n) -9.23960000D+00
51121 (n,3n) -1.62457000D+01
51121 (n,4n) -2.58364000D+01 Over 20 MeV
51123 (n,2n) -8.96610000D+00
51123 (n,3n) -1.57738000D+01
51123 (n,4n) -2.50130000D+01 Over 20 MeV
51124 ----- No (n,Xn)
51125 ----- No (n,Xn)
51126 ----- No (n,Xn)
52120 ----- No (n,Xn)

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52122 ----- No (n,Xn)  
 52123 ----- No (n,Xn)  
 52124 ----- No (n,Xn)  
 52125 ----- No (n,Xn)  
 52126 ----- No (n,Xn)  
 52127 ----- No (n,Xn)  
 52128 ----- No (n,Xn)  
 52129 ----- No (n,Xn)  
 52130 ----- No (n,Xn)  
 52132 ----- No (n,Xn)  
 53127 (n,2n) -9.13738000D+00  
 53127 (n,3n) -1.62787000D+01  
 53127 (n,4n) -2.58281000D+01 Over 20 MeV  
 53129 ----- No (n,Xn)  
 53130 ----- No (n,Xn)  
 53131 ----- No (n,Xn)  
 53135 ----- No (n,Xn)  
 54124 (n,2n) -1.02300000D+01  
 54124 (n,3n) -1.85300000D+01  
 54124 (n,4n) No Data  
 54126 (n,2n) -1.00900000D+01  
 54126 (n,3n) -1.78600000D+01  
 54126 (n,4n) No Data  
 54128 (n,2n) -9.61400000D+00  
 54128 (n,3n) -1.68390000D+01  
 54128 (n,4n) No Data  
 54129 (n,2n) -6.90500000D+00  
 54129 (n,3n) -1.65200000D+01  
 54129 (n,4n) No Data  
 54130 (n,2n) -9.25800000D+00  
 54130 (n,3n) -1.61630000D+01  
 54130 (n,4n) No Data  
 54131 (n,2n) -6.60560000D+00  
 54131 (n,3n) -1.58640000D+01  
 54131 (n,4n) No Data  
 54132 (n,2n) -8.93610000D+00  
 54132 (n,3n) -1.55420000D+01  
 54132 (n,4n) No Data  
 54133 ----- No (n,Xn)  
 54134 (n,2n) -8.53500000D+00  
 54134 (n,3n) -1.49880000D+01  
 54134 (n,4n) No Data  
 54135 ----- No (n,Xn)  
 54136 (n,2n) -7.99200000D+00  
 54136 (n,3n) -1.44430000D+01  
 54136 (n,4n) No Data  
 55133 (n,2n) -9.03800000D+00  
 55133 (n,3n) No Data  
 55133 (n,4n) No Data  
 55134 ----- No (n,Xn)  
 55135 ----- No (n,Xn)  
 55136 ----- No (n,Xn)  
 55137 ----- No (n,Xn)  
 56134 (n,2n) -9.47510000D+00  
 56134 (n,3n) -1.66672000D+01  
 56134 (n,4n) No Data  
 56135 ----- No (n,Xn)

56136 ----- No (n,Xn)  
 56137 ----- No (n,Xn)  
 56138 (n,2n) -8.58719000D+00  
 56138 (n,3n) -1.55364000D+01  
 56138 (n,4n) No Data  
 56140 ----- No (n,Xn)  
 57139 ----- No (n,Xn)  
 57140 ----- No (n,Xn)  
 58140 ----- No (n,Xn)  
 58141 ----- No (n,Xn)  
 58142 ----- No (n,Xn)  
 58143 ----- No (n,Xn)  
 58144 ----- No (n,Xn)  
 59141 (n,2n) -8.93600000D+00  
 59141 (n,3n) -1.73760000D+01  
 59141 (n,4n) No Data  
 59142 ----- No (n,Xn)  
 59143 ----- No (n,Xn)  
 60142 ----- No (n,Xn)  
 60143 (n,2n) -5.95800000D+00  
 60143 (n,3n) -1.58880000D+01  
 60143 (n,4n) No Data  
 60144 ----- No (n,Xn)  
 60145 (n,2n) -5.46200000D+00  
 60145 (n,3n) -1.34070000D+01  
 60145 (n,4n) No Data  
 60146 (n,2n) -7.44850000D+00  
 60146 (n,3n) -1.29110000D+01  
 60146 (n,4n) No Data  
 60147 ----- No (n,Xn)  
 60148 (n,2n) -6.95250000D+00  
 60148 (n,3n) -1.24150000D+01  
 60148 (n,4n) No Data  
 60150 (n,2n) -6.95320000D+00  
 60150 (n,3n) -1.24230000D+01  
 60150 (n,4n) No Data  
 61147 (n,2n) -7.44880000D+00  
 61147 (n,3n) -1.39140000D+01  
 61147 (n,4n) No Data  
 61148 ----- No (n,Xn)  
 61148 ----- No (n,Xn)  
 61149 ----- No (n,Xn)  
 61151 ----- No (n,Xn)  
 62144 (n,2n) -1.09230000D+01  
 62144 (n,3n) No Data  
 62144 (n,4n) No Data  
 62147 (n,2n) -5.95910000D+00  
 62147 (n,3n) -1.44010000D+01  
 62147 (n,4n) No Data  
 62148 ----- No (n,Xn)  
 62149 (n,2n) -5.86000000D+00  
 62149 (n,3n) -1.40700000D+01  
 62149 (n,4n) No Data  
 62150 (n,2n) -8.03900000D+00  
 62150 (n,3n) No Data  
 62150 (n,4n) No Data  
 62151 (n,2n) -5.46350000D+00

62151 (n,3n) -1.34100000D+01  
 62151 (n,4n) No Data  
 62152 (n,2n) -7.94730000D+00  
 62152 (n,3n) -1.34130000D+01  
 62152 (n,4n) No Data  
 62153 ----- No (n,Xn)  
 62154 ----- No (n,Xn)  
 63151 (n,2n) -7.96820000D+00  
 63151 (n,3n) -1.43540000D+01  
 63151 (n,4n) No Data  
 63152 (n,2n) -6.30500000D+00  
 63152 (n,3n) -1.42760000D+01  
 63152 (n,4n) No Data  
 63153 (n,2n) -8.45000000D+00  
 63153 (n,3n) -1.47000000D+01  
 63153 (n,4n) No Data  
 63154 (n,2n) -6.43800000D+00  
 63154 (n,3n) -1.49900000D+01  
 63154 (n,4n) No Data  
 63155 (n,2n) -7.94820000D+00  
 63155 (n,3n) -1.44060000D+01  
 63155 (n,4n) No Data  
 63156 ----- No (n,Xn)  
 63157 ----- No (n,Xn)  
 64152 (n,2n) -8.61109000D+00  
 64152 (n,3n) -1.50902000D+01  
 64152 (n,4n) No Data  
 64154 (n,2n) -8.66110000D+00  
 64154 (n,3n) -1.51532000D+01  
 64154 (n,4n) No Data  
 64155 (n,2n) -6.43750000D+00  
 64155 (n,3n) No Data  
 64155 (n,4n) No Data  
 64156 (n,2n) -8.53650000D+00  
 64156 (n,3n) No Data  
 64156 (n,4n) No Data  
 64157 (n,2n) -6.35950000D+00  
 64157 (n,3n) No Data  
 64157 (n,4n) No Data  
 64158 (n,2n) -7.93750000D+00  
 64158 (n,3n) No Data  
 64158 (n,4n) No Data  
 64160 (n,2n) -7.45850000D+00  
 64160 (n,3n) No Data  
 64160 (n,4n) No Data  
 65159 ----- No (n,Xn)  
 65160 ----- No (n,Xn)  
 66160 ----- No (n,Xn)  
 66161 ----- No (n,Xn)  
 66162 ----- No (n,Xn)  
 66163 ----- No (n,Xn)  
 66164 (n,2n) -7.64000000D+00  
 66164 (n,3n) -1.38950000D+01  
 66164 (n,4n) No Data  
 67165 (n,2n) -8.03040000D+00  
 67165 (n,3n) -1.46600000D+01  
 67165 (n,4n) -2.30630000D+01 Over 20 MeV

68166	-----	No (n,Xn)
68167	-----	No (n,Xn)
<b>*****SG23 range ends here *****</b>		
71175	(n,2n)	-7.8100000D+00
71175	(n,3n)	-1.4420000D+01
71175	(n,4n)	No Data
71176	(n,2n)	-6.3400000D+00
71176	(n,3n)	-1.4150000D+01
71176	(n,4n)	No Data
72000	(n,2n)	-6.0700000D+00
72000	(n,3n)	No Data
72000	(n,4n)	No Data
72174	(n,2n)	-8.5700000D+00
72174	(n,3n)	No Data
72174	(n,4n)	No Data
72176	(n,2n)	-8.0900000D+00
72176	(n,3n)	No Data
72176	(n,4n)	No Data
72177	(n,2n)	-6.3800000D+00
72177	(n,3n)	No Data
72177	(n,4n)	No Data
72178	(n,2n)	-7.6300000D+00
72178	(n,3n)	No Data
72178	(n,4n)	No Data
72179	(n,2n)	-6.1000000D+00
72179	(n,3n)	No Data
72179	(n,4n)	No Data
72180	(n,2n)	-7.3900000D+00
72180	(n,3n)	No Data
72180	(n,4n)	No Data
73181	(n,2n)	-7.6300000D+00
73181	(n,3n)	-1.4220000D+01
73181	(n,4n)	No Data
73182	(n,2n)	-6.06640000D+00
73182	(n,3n)	-1.37240000D+01
73182	(n,4n)	No Data
74000	(n,2n)	-6.19040000D+00
74000	(n,3n)	-1.29540000D+01
74000	(n,4n)	No Data
74182	(n,2n)	-8.06240000D+00
74182	(n,3n)	-1.47470000D+01
74182	(n,4n)	No Data
74183	(n,2n)	-6.19040000D+00
74183	(n,3n)	-1.42530000D+01
74183	(n,4n)	No Data
74184	(n,2n)	-7.41140000D+00
74184	(n,3n)	-1.36020000D+01
74184	(n,4n)	No Data
74186	(n,2n)	-7.19950000D+00
74186	(n,3n)	-1.29540000D+01
74186	(n,4n)	No Data
75185	(n,2n)	-7.67738000D+00
75185	(n,3n)	-1.41557600D+01
75185	(n,4n)	No Data
75187	(n,2n)	-7.36038000D+00
75187	(n,3n)	-1.35387600D+01
75187	(n,4n)	No Data

77191	(n,2n)	-7.76500000D+00
77191	(n,3n)	-1.39640000D+01
77191	(n,4n)	No Data
77193	(n,2n)	-7.76500000D+00
77193	(n,3n)	-1.39640000D+01
77193	(n,4n)	No Data
79197	(n,2n)	-8.05940000D+00
79197	(n,3n)	-1.47210000D+01
79197	(n,4n)	-2.31080000D+01 Over 20 MeV
82206	(n,2n)	-8.08570000D+00
82206	(n,3n)	-1.48160000D+01
82206	(n,4n)	No Data
82207	(n,2n)	-6.73300000D+00
82207	(n,3n)	-1.48170000D+01
82207	(n,4n)	No Data
82208	(n,2n)	-7.36740000D+00
82208	(n,3n)	-1.41058000D+01
82208	(n,4n)	-2.21931000D+01 Over 20 MeV
83209	(n,2n)	-7.46000000D+00
83209	(n,3n)	-1.43510000D+01
83209	(n,4n)	No Data
90230	(n,2n)	-6.79110000D+00
90230	(n,3n)	-1.20400000D+01
90230	(n,4n)	No Data
90232	(n,2n)	-6.34000000D+00
90232	(n,3n)	-1.13700000D+01
90232	(n,4n)	No Data
91231	(n,2n)	-6.81380000D+00
91231	(n,3n)	-1.26060000D+01
91231	(n,4n)	No Data
91232	(n,2n)	-5.56079000D+00
91232	(n,3n)	-1.23749000D+01
91232	(n,4n)	-1.81681000D+01
91233	(n,2n)	-6.65560000D+00
91233	(n,3n)	-1.21790000D+01
91233	(n,4n)	No Data
92232	(n,2n)	-7.25469000D+00
92232	(n,3n)	-1.31534000D+01
92232	(n,4n)	No Data
92233	(n,2n)	-5.74200000D+00
92233	(n,3n)	-1.30100000D+01
92233	(n,4n)	No Data
92234	(n,2n)	-6.77100000D+00
92234	(n,3n)	-1.26700000D+01
92234	(n,4n)	No Data
92235	(n,2n)	-5.29778100D+00
92235	(n,3n)	-1.21423000D+01
92235	(n,4n)	-1.78856000D+01
92236	(n,2n)	-6.91040000D+00
92236	(n,3n)	-1.16400000D+01
92236	(n,4n)	No Data
92237	(n,2n)	-5.12000000D+00
92237	(n,3n)	-1.16700000D+01
92237	(n,4n)	No Data
92238	(n,2n)	-6.15280000D+00
92238	(n,3n)	-1.12786000D+01
92238	(n,4n)	-1.78237000D+01

93236	(n, 2n)	-5.72979000D+00
93236	(n, 3n)	-1.27090000D+01
93236	(n, 4n)	No Data
93237	(n, 2n)	-6.57308000D+00
93237	(n, 3n)	-1.23137000D+01
93237	(n, 4n)	-1.92978000D+01
93238	-----	No (n, Xn)
93239	(n, 2n)	-6.22702000D+00
93239	(n, 3n)	-1.17056000D+01
93239	(n, 4n)	No Data
94236	(n, 2n)	-7.36163000D+00
94236	(n, 3n)	-1.36063000D+01
94236	(n, 4n)	No Data
94237	(n, 2n)	-5.83420000D+00
94237	(n, 3n)	-1.32200000D+01
94237	(n, 4n)	No Data
94238	(n, 2n)	-6.97050000D+00
94238	(n, 3n)	-1.28570000D+01
94238	(n, 4n)	No Data
94239	(n, 2n)	-5.64670000D+00
94239	(n, 3n)	-1.26480000D+01
94239	(n, 4n)	-1.85083000D+01
94240	(n, 2n)	-6.53350000D+00
94240	(n, 3n)	-1.21890000D+01
94240	(n, 4n)	No Data
94241	(n, 2n)	-5.24804100D+00
94241	(n, 3n)	-1.17010000D+01
94241	(n, 4n)	No Data
94242	(n, 2n)	-6.30080000D+00
94242	(n, 3n)	-1.15410000D+01
94242	(n, 4n)	No Data
94243	(n, 2n)	-5.03920000D+00
94243	(n, 3n)	-1.13330000D+01
94243	(n, 4n)	-1.65810000D+01
94244	(n, 2n)	-5.99320000D+00
94244	(n, 3n)	-1.10550000D+01
94244	(n, 4n)	-1.73563000D+01
95241	(n, 2n)	-6.63828100D+00
95241	(n, 3n)	-1.25967000D+01
95241	(n, 4n)	-1.97030000D+01
95242	-----	No (n, Xn)
95242	(n, 2n)	-5.45610000D+00
95242	(n, 3n)	-1.21900000D+01
95242	(n, 4n)	-1.80900000D+01
95243	(n, 2n)	-6.36528000D+00
95243	(n, 3n)	-1.19044000D+01
95243	(n, 4n)	-1.85426000D+01
96241	(n, 2n)	-6.04470000D+00
96241	(n, 3n)	-1.35300000D+01
96241	(n, 4n)	No Data
96242	(n, 2n)	-6.93910000D+00
96242	(n, 3n)	-1.30380000D+01
96242	(n, 4n)	No Data
96243	(n, 2n)	-5.69371000D+00
96243	(n, 3n)	-1.26638000D+01
96243	(n, 4n)	No Data
96244	(n, 2n)	-6.77100000D+00

96244	(n, 3n)	-1.24987000D+01
96244	(n, 4n)	No Data
96245	(n, 2n)	-5.52000000D+00
96245	(n, 3n)	-1.23200000D+01
96245	(n, 4n)	No Data
96246	(n, 2n)	-6.45800000D+00
96246	(n, 3n)	-1.19780000D+01
96246	(n, 4n)	No Data
96247	(n, 2n)	-5.15000000D+00
96247	(n, 3n)	-1.16000000D+01
96247	(n, 4n)	-1.71000000D+01
96248	(n, 2n)	-6.18490000D+00
96248	(n, 3n)	-1.13640000D+01
96248	(n, 4n)	-1.78200000D+01
97249	(n, 2n)	-6.21370000D+00
97249	(n, 3n)	-1.17790000D+01
97249	(n, 4n)	No Data
98249	(n, 2n)	-5.59310000D+00
98249	(n, 3n)	-1.25720000D+01
98249	(n, 4n)	No Data
98250	(n, 2n)	-6.61000000D+00
98250	(n, 3n)	-1.22100000D+01
98250	(n, 4n)	-1.85900000D+01
98251	(n, 2n)	-5.10000000D+00
98251	(n, 3n)	-1.17300000D+01
98251	(n, 4n)	-1.73200000D+01
98252	(n, 2n)	-6.17000000D+00
98252	(n, 3n)	-1.12800000D+01
98252	(n, 4n)	-1.79000000D+01
98253	-----	No (n, Xn)
99253	-----	No (n, Xn)